



Implementation Issues: What doesn't kill us, costs us

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RCM Digesters - Who We Are

- Digesters are our only business,
 - >20 years in the digester business
 - >50 digesters operating
 - Staff of >10 in Oakland, California
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What RCM Digesters does:

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- A photograph of an industrial facility, likely a waste-to-energy plant. In the center, a large furnace or digester is glowing with intense orange and yellow heat. To the right, a worker in dark clothing is standing near a complex system of pipes and machinery. The foreground shows a concrete floor and metal scaffolding.
- 1. Budget Prices**
 - 2. Feasibility Study**
 - 3. Design and equipment supply**
 - 4. Turnkey construction**

Implementation Issues:

Time consuming requirements

■ Permits

- Local – who loves you? Zoning, Sierra Club
- State – depends on rules – easy or not
- Federal – not yet

■ Utilities –

- Where is the love?
 - Where is the schedule?
 - time is on their side
 - Remember electricity is free
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Implementation Delay

- Equipment
 - Yes I want it there
 - The price is what this week?
 - Construction
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Operator – hands on

- Screw driver friendly or an inventor
 - Training or trainable
 - Manuals are not to hold the door open
 - Loss of means starting over
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Operations/Operator Challenge

- Feedstock and Feeding
 - Feed Timing
 - How much, what kind, when
 - Too much is bad
 - Too little is bad
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The Rules for organics

- Rule 1. There are no rules.
 - Not all waste is equal.
 - Waste means waste to the producer.
 - Truckload means what's in the truck.
 - Quality or quantity?
 - Never on Sunday unless its Sunday.
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Matlink Dairy, Clymer, NY



900 cows + organic wastes, 130 kW

Up to 225,000 ft³/d, solids separated

[RCM Digesters.com](http://RCMDigesters.com)

The learning

- Check what's in the truck
 - Big flares can be your friend
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RCM Complete Mix Digester

A large, covered anaerobic digester tank at Gypsy Hill Farm. The tank is covered with a dark, corrugated material, likely plastic or metal, and is situated under a wooden structure. The background shows the wooden framework of the building.

Gypsy Hill Farm - Lancaster, PA

4,000 Pigs and Whey

Biogas and 120 kW since 1983

Original: Energy Cycle 1983

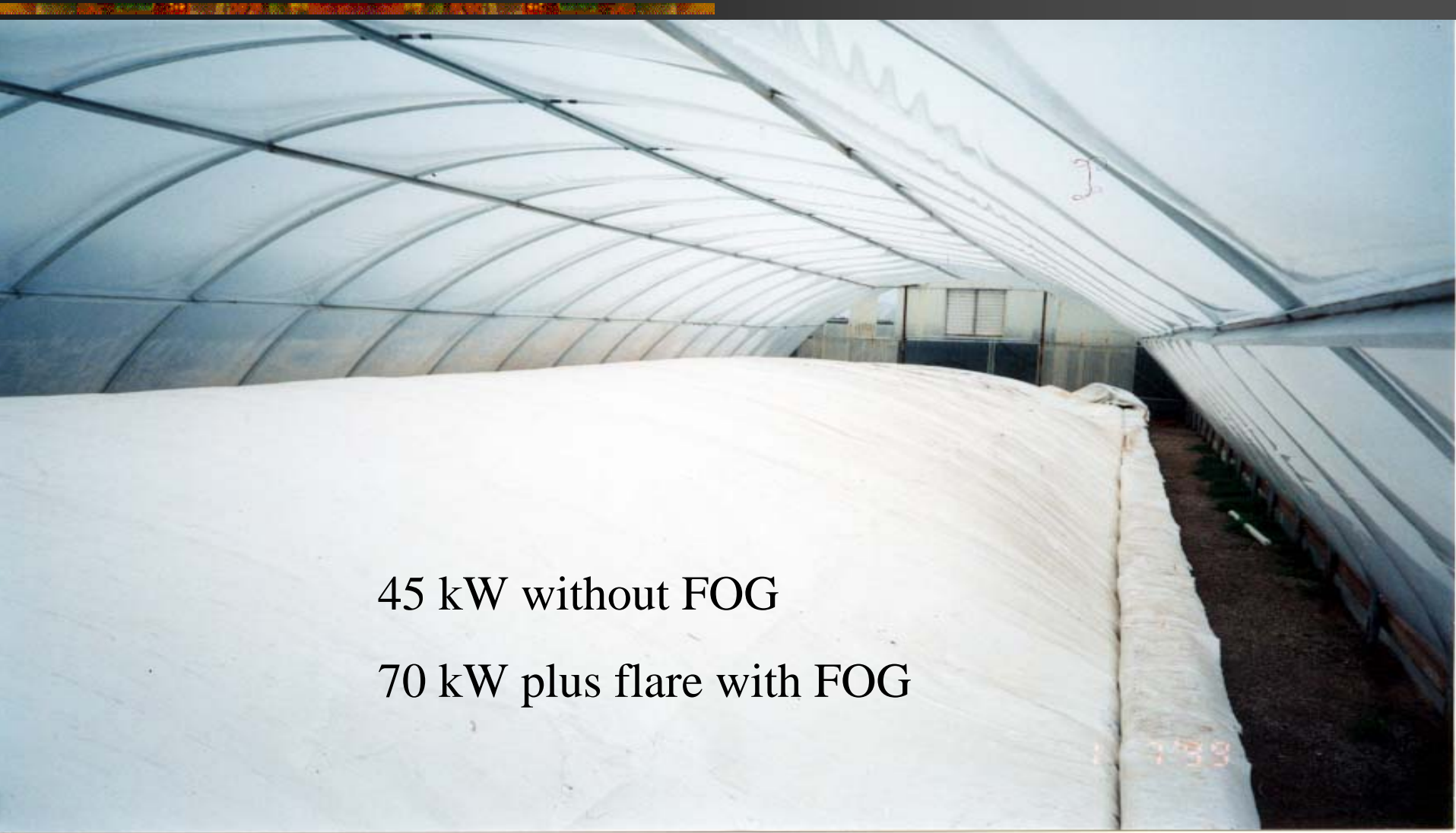
RCM: redesign, rebuild, increase capacity 2000

The learning:

- Steady is good
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Langerwerf Dairy, Durham, CA

1983, 350 cows, 70 kW,



45 kW without FOG

70 kW plus flare with FOG

The learning:

- Too much of a good thing is bad
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Kluthe Farm— Dodge, NE, 2006

8,000 finish hogs, 70 kW,



The learning:

- Ditto on too much of a good thing.
 - The consultant really meant what he said.
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Patterson Dairy, Auburn, NY, 2005, 1200 cows and whey, 200 kW, big flare, solids



The learning:

- Ditto on the big flare, gas keeps on coming
 - One mans whey permeate is another mans processed whey concentrate
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Van Ommerring Dairy, Lakeside, CA.
2005, 600 cows, thick FOG, 130 kW




The learning:

- Steady feeding keeps the engine running
 - Ditto on the evil nature of utilities – (Sorry I can't help myself)
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The learning:



- Learning has no end and
 - Déjà vu happens all over again.
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Castelanelli Dairy – 180 kW



Gas Handling

Castelanelli, Lodi, Ca



WPF – Wheatland, Wyoming, 2004
18,000 finish hogs, heated, mixed,
concrete tank digester 160 kW engine,



Agro Super, Chile, 2002

120,000 finish hogs
heated, mixed, covered digester, boiler





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